Amendments to the Claims:

Please replace all prior versions, and listings of claims in the application with the following listing of claims.

Listing of claims

What is claimed is:

Claim (currently amended): A method of determining a phase offset between signaling channels in a communication system, comprising the steps of:

deriving a first set of channel estimates from symbols received through a first signaling channel;

deriving a second set of channel estimates from symbols received through a second signaling channel; and

determining an estimate of the phase offset based on a set of first and second antenna phase estimates derived from the first and second sets of channel estimates, respectively.

Claim 2 (original): The method of claim 1, wherein the first and second signaling channels are pilot channels.

Claim 3 (currently amended): The method of claim 1, wherein the first and second signaling channels are a ~~DPCH and CPICH~~ common pilot channel (CPICH) and a dedicated physical channel (DPCH), respectively.

Claim 4 (currently amended): A method of determining a set of complex channel estimates for a transmission channel in a communication system, comprising the steps of:

deriving a first set of channel estimates from symbols received through a first signaling channel;

deriving a second set of channel estimates from symbols received through a second signaling channel;

determining a phase offset value, , between signaling channels in the communication system based on a set of first and second antenna phase estimates derived from the first and second sets of channel estimates, respectively; and

determining the set of complex channel estimates based on the phase offset value and [[a]] the first set of channel estimates.

Claim 5 (currently amended): The method of claim 4, wherein the phase offset value is determined by choosing among a set of predetermined feasible choices of that minimizes the following expression:

$$\min_{\varphi \in \{\pi/4, 3\pi/4, 5\pi/4, 7\pi/4\}} \sum_{i=1}^{n} \frac{\left(\hat{\alpha}_i - \hat{\beta}_i + \varphi\right)^2}{\sigma_{ei}^2}$$

where:

$i \in [1, n]$ is a rake finger number of the receiver, and

$\cancel{\hat{\alpha} \text{ and } \hat{\beta}}$ $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the respective first and second antenna phase estimates derived for rake finger i from the first and second sets of channel estimates, and

$\cancel{\sigma_{ei}}$ σ_{ei}^2 is related to the power of interference.

Claim 6 (original): The method of claim 5, wherein the complex channel estimate is determined by performing a linear combination of the first and second set of channel estimates.

Claim 7 (currently amended): A channel estimator adapted to operate with a receiver in a communication system and to determine a set of complex channel estimates for a transmission channel of the communication system, the channel estimator comprising:

means that derive a first set of channel estimates from symbols received through a first signaling channel;

means that derive a second set of channel estimates from symbols received through a second signaling channel;

means that determine a phase offset value, , between signaling channels in the communication system based on a set of first and second antenna phase estimates derived from the first and second sets of channel estimates, respectively; and

means that determine the set of complex channel estimates based on the phase offset value and [[a]] the first set of channel estimates.

Claim 8 (currently amended): The channel estimator of claim 7, wherein the means that determine a phase offset value comprise:

means that de-rotate the symbols received through the first and second signaling channels;

means that filter the de-rotated symbols;

means that convert the filtered de-rotated symbols to polar representations;

means that calculate the phase ~~estimate~~ offset value according to the polar representations.

Claim 9 (currently amended): The channel estimator of claim 8, wherein the phase offset [[is]] value is calculated by choosing among a set of predetermined feasible choices of that minimizes the following expression:

$$\min_{\varphi \in \{\pi/4, 3\pi/4, 5\pi/4, 7\pi/4\}} \sum_{i=1}^{n} \frac{\left(\hat{\alpha}_i - \hat{\beta}_i + \varphi\right)^2}{\sigma_{ei}^2}$$

where:

$i \in [1, n]$ is a rake finger number of the receiver, and

~~$\hat{\alpha}$ and $\hat{\beta}$~~ $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the respective first and second antenna phase estimates derived for rake finger i from the first and second sets of channel estimates, and

~~σ_{ei}~~ σ_{ei}^2 is related to the power of interference.

Claim 10 (original): The channel estimator of claim 7, wherein the set of complex channel estimates is determined by performing a linear combination of the first and second set of channel estimates.

Claim 11 (original): The channel estimator of claim 7, wherein the receiver is a RAKE receiver.

Claim 12 (original): The channel estimator of claim 7, wherein the receiver operates in a cellular communication system.

Claim 13 (original): The channel estimator of claim 7, wherein the first and second signaling channels are received by the receiver after transmission using transmit diversity.

Claim 14 (currently amended): User equipment for a communication system, the user equipment adapted to determine a set of complex channel estimates for a transmission channel of the communication system, the user equipment comprising:

means that derive a first set of channel estimates from symbols received through a first signaling channel;

means that derive a second set of channel estimates from symbols received through a second signaling channel;

means that determine a phase offset value, , between signaling channels in the communication system based on a set of first and second antenna phase estimates derived from the first and second sets of channel estimates, respectively; and

means that determine the set of complex channel estimates based on the phase offset value and [[a]] the first set of channel estimates.

Claim 15 (currently amended): The user equipment of claim 14, wherein the means that determine a phase offset value comprise:

means that de-rotate the symbols received through the first and second signaling channels;

means that filter the de-rotated symbols;

means that convert the filtered de-rotated symbols to polar representations;

means that calculate the phase ~~estimate~~ offset value according to the polar representations.

Claim 16 (currently amended): The user equipment of claim 14, wherein the phase offset [[is]] value is calculated by choosing among a set of predetermined feasible choices of that minimizes the following expression:

$$\min_{\varphi \in \{\pi/4, 3\pi/4, 5\pi/4, 7\pi/4\}} \sum_{i=1}^{n} \frac{\left(\hat{\alpha}_i - \hat{\beta}_i + \varphi\right)^2}{\sigma_{ei}^2}$$

where:

$i \in [1, n]$ is a rake finger number of the receiver, and

$\cancel{\hat{\alpha}}$ ~~and~~ $\cancel{\hat{\beta}}$ $\underline{\hat{\alpha}_i}$ and $\underline{\hat{\beta}_i}$ are the respective first and second antenna phase estimates derived for rake finger i from the first and second sets of channel estimates, and

$\cancel{\sigma_{ei}}$ $\underline{\sigma_{ei}^2}$ is related to the power of interference.

Claim 17 (original): The user equipment of claim 14, wherein the set of complex channel estimates is determined by performing a linear combination of the first and second set of channel estimates.

Claim 18 (new): The method of claim 4, wherein the first and second signaling channels are a common pilot channel (CPICH) and a dedicated physical channel (DPCH), respectively.

Claim 19 (new): The method of claim 7, wherein the first and second signaling channels are a common pilot channel (CPICH) and a dedicated physical channel (DPCH), respectively.

Claim 20 (new): The method of claim 14, wherein the first and second signaling channels are a common pilot channel (CPICH) and a dedicated physical channel (DPCH), respectively.

Claim 21 (new): The method of claim 1, wherein the estimate of the phase offset is determined by choosing a phase offset value, , among a set of predetermined feasible choices of that minimizes the following expression:

$$\min_{\varphi \in \{\pi/4, 3\pi/4, 5\pi/4, 7\pi/4\}} \sum_{i=1}^{n} \frac{\left(\hat{\alpha}_i - \hat{\beta}_i + \varphi\right)^2}{\sigma_{ei}^2}$$

where:

$i \in [1, n]$ is a rake finger number of the receiver, and

$\hat{\alpha}_i$ and $\hat{\beta}_i$ are the respective first and second antenna phase estimates derived for rake finger i from the first and second sets of channel estimates, and

σ_{ei}^2 is related to the power of interference.